Rec'd PET/PT@ 3 0 NOV 2004

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization International Bureau



(43) International Publication Date 11 December 2003 (11.12.2003)

PCT

(10) International Publication Number WO 03/101894 A2

(51) International Patent Classification7:

C02F 1/00

- (21) International Application Number: PCT/US03/16786
- (22) International Filing Date: 29 May 2003 (29.05.2003)
- (25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data: 60/384,776

30 May 2002 (30.05.2002) US

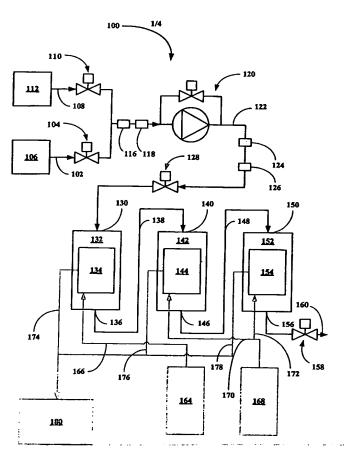
- (71) Applicant (for all designated States except US): LOBO LIQUIDS, LLC [US/US]; 18937 Aldine-Westfield Road, Houston, TX 77073 (US).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): TUNNICLIFFE, Ian [GB/GB]; Cotsdale, Watling Street North, Church

Stretton, Shropshire SY6 7AR (GB). MT JOY, Raymond [US/US]; 18511 Brackenfield Drive, Spring, TX 77388 (US).

- (74) Agent: STROZIER, Robert, W.; Robert W. Strozier, PLLC, P.O. Box 429, Bellaire, TX 77402-0429 (US).
- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO,

[Continued on next page]

(54) Title: METHOD AND APPARATUS FOR TREATING METAL ION CONTAINING STREAMS



(57) Abstract: A method for removing metal ions from aqueous streams is disclosed using an extraction system of this invention, which includes at least one and preferably a plurality of extraction units comprising a bed filled with a volumetric mixture of an ion exchange material and an inert material. Preferably, the mixture includes between about 90 to 50 vol% of an ion exchange material and from about 10 to 50 vol% of an a substantially inert material. The method is designed to operate at a relatively high stream flow rate, preferably between about 1.5 and about 5 times greater than the flow rate of the stream not equipped with the present extraction system.

WO 03/101894 A2